

In the Claims:

## Listing of all claims:

- 1 1. (Currently Amended) A welding, cutting or heating power source capable of receiving a range of input voltages, comprising:
  - 4 an input rectifier configured to receive an ac input and providing a first dc signal;
  - 6 a boost stage configured to receive the first dc signal and providing a boosted second dc signal;
  - 8 an inverter configured to receive the second dc signal and providing a second ac signal and configured to receive at least one control input;
  - 11 an output transformer configured to receive the second ac signal and providing a third ac signal having a current suitable for welding;
  - 14 an output circuit configured to receive the third ac signal and providing a welding, heating or cutting signal;
  - 16 a controller configured to provide at least one control signal to the inverter; and
  - 18 an auxiliary power controller circuit configured to receive a range of input voltages and providing a control power signal to the controller.

2-24. (Cancelled.)

- 1 25. (New) A welding, cutting or heating system capable of receiving a range of input voltages spanning at least two input utility voltages, comprising:
  - 4 an input circuit configured to receive any input voltage within the range of input voltages, and configured to provide a first dc signal;

7                   a converter configured to receive the first dc  
8                   signal and to provide a converter output, and configured to  
9                   receive at least one control input;

10                  an output circuit configured to receive the  
11                  converter output and to provide a welding, heating or  
12                  cutting signal; and

13                  a controller, including a power factor correction  
14                  circuit, configured to provide at least one control signal  
15                  to the converter.

1                  26. (New)    The system of claim 25, further  
2                  comprising an auxiliary power source configured to receive any  
3                  voltage within the range of input voltages and configured to  
4                  provide a control power signal to the controller.

1                  27. (New)    The system of claim 26, wherein the  
2                  auxiliary power controller is capable of providing the control  
3                  power signal at a preselected control signal voltage, regardless  
4                  of the magnitude of the input voltage.

1                  28. (New)    The system of claim 27, wherein the  
2                  output circuit further comprises a pulsed transformer.

1                  29. (New)    The system of claim 28, wherein the  
2                  convertor includes a boost circuit.

1                  30. (New)    The system of claim 29, wherein the  
2                  output circuit includes a pulse width modulator connected to the  
3                  transformer.

1                  31. (New)    The system of claim 30, wherein the  
2                  range of input voltages spans at least a factor of two.

1                   32. (New)    A method of providing welding,  
2    cutting or heating current from a range of input voltages  
3    spanning at least two input utility voltages, comprising:  
4                    receiving the input voltage and converting it to a  
5    first dc bus having a voltage magnitude higher than the  
6    input voltage;  
7                    controlling the converting, including power factor  
8    correcting by controlling a switch; and  
9                    receiving the dc bus and providing in response  
10    thereto an output current having an output magnitude  
11    suitable for a welding, heating or cutting.

1                   33. (New)    The method of claim 32, wherein  
2    converting includes rectifying.

1                   34. (New)    The method of claim 32, further  
2    comprising deriving auxiliary power from any voltage within the  
3    range of input voltages and providing the derived power as a  
4    power signal to a controller.

1                   35. (New)    The method of claim 34, wherein  
2    providing the derived power includes providing the derived power  
3    at a preselected control signal voltage, regardless of the  
4    magnitude of the input voltage.

1                   36. (New)    The method system of claim 34, wherein  
2    providing in response thereto includes pulsing a transformer.

1                   37. (New)    The method of claim 36, wherein  
2    converting includes boost converting.

1                   38. (New)    The method of claim 37, wherein  
2    providing in response thereto further comprises pulse width  
3    modulating the transformer.

1                   39. (New)       The method of claim 38, wherein the  
2 range of input voltages spans at least a factor of two.

1                   40. (New)       The method of claim 38 wherein providing  
2 in response thereto further comprises rectifying the output of  
3 the transformer.

1                   41. (New)       A welding, cutting or heating  
2 system capable of receiving a range of input voltages  
3 spanning at least two input utility voltages, comprising:  
4                   input means for receiving any input voltage within  
5 the range of input voltages, and for providing a first dc  
6 signal;

7                   converter means for receiving the first dc signal  
8 and providing a converter output in response to at least one  
9 control input;

10                  output means for receiving the converter output  
11 and providing a welding, heating or cutting signal; and  
12                  control means for controlling, including power  
13 factor correcting, the converter means, connected to the  
14 converter means.

1                   42. (New)       The system of claim 41, further  
2 comprising auxiliary power means for providing a control power  
3 signal to the controller in response to receiving any voltage  
4 within the range of input voltages.

1                   43. (New)       The system of claim 41, wherein the  
2 auxiliary power means is further for providing the control power  
3 signal at a preselected control signal voltage regardless of the  
4 magnitude of the input voltage.

1                   44. (New)    The system of claim 41, wherein the  
2    output means further comprises means for pulsing a transformer.

1                   45. (New)    The system of claim 44, wherein the  
2    convertor means includes means for boosting a voltage.

1                   46. (New)    The system of claim 44, wherein the  
2    output means further includes means for pulse width modulating  
3    the transformer.

1                   47. (New)    The system of claim 41, wherein the  
2    range of input voltages spans at least a factor of two.

1                   48. (New)    A power source for welding, cutting  
2    or heating current, comprising:

3                   means for receiving and converting an input  
4    voltage from a range of input voltages spanning at least two  
5    input utility voltages to a first dc bus having a voltage  
6    magnitude higher than the input voltage;

7                   means for controlling the means for receiving and  
8    converting, including means for power factor correcting by  
9    controlling a switch, connected to the means for receiving  
10   and converting; and

11                  means for receiving the dc bus and providing in  
12    response thereto an output current having an output  
13    magnitude suitable for a welding, heating or cutting.

1                   49. (New)    The power source of claim 48, wherein  
2    the means for receiving and converting includes means for  
3    rectifying.

1                   50. (New)    The power source of claim 48, further  
2    comprising means for deriving auxiliary power from any voltage

3 within the range of input voltages and providing the derived  
4 power as a power signal to the means for controlling.

1 51. (New) The power source of claim 48, wherein  
2 the means for deriving power includes means for providing the  
3 derived power at a preselected control signal voltage, regardless  
4 of the magnitude of the input voltage.

1 52. (New) The power source of claim 51, wherein  
2 the means for receiving and converting includes means for boost  
3 converting to provide the first dc bus.

1 53. (New) The power source of claim 48, wherein  
2 the range of input voltages spans at least a factor of two.

1 54. (New) A welding, cutting or heating  
2 system capable of receiving a range of input voltages  
3 spanning at least two input utility voltages, comprising:  
4 a power circuit comprising an input circuit, a  
5 converter and an output circuit, wherein the power circuit  
6 is capable of providing a welding cutting or heating output  
7 without reconfiguring a power circuit;

8 wherein the input circuit is configured to receive  
9 any input voltage within the range of input voltages, and  
10 configured to provide a first dc signal;

11 wherein the converter includes a boost circuit and  
12 is configured to receive and boost the first dc signal and  
13 to provide a converter output, and configured to receive at  
14 least one control input;

15 wherein the output circuit is configured to  
16 receive the converter output and to provide the welding,  
17 heating or cutting signal; and

18                   a controller, including a power factor correction  
19                   circuit, configured to provide at least one control signal  
20                   to the converter.

1               55. (New)   The system of claim 54, further  
2               comprising an auxiliary power circuit configured to receive any  
3               voltage within the range of input voltages and configured to  
4               provide a control power signal to the controller.

1               56. (New)   The system of claim 54, wherein the  
2               output circuit further comprises a pulsed transformer.

1               57. (New)   The system of claim 56, wherein the  
2               output circuit includes a pulse width modulator connected to the  
3               transformer.

1               58. (New)   A method of providing welding,  
2               cutting or heating current from a range of input voltages  
3               spanning at least two input utility voltages, comprising:  
4               receiving the input voltage and converting it to a  
5               first dc bus having a voltage magnitude higher than the  
6               input voltage, without reconfiguring a power circuit;  
7               controlling the converting, including power factor  
8               correcting by controlling a switch; and  
9               receiving the dc bus and providing in response  
10              thereto an output current having an output magnitude  
11              suitable for a welding, heating or cutting.

1               59. (New)   The method of claim 58, wherein  
2               converting includes rectifying.

1               60. (New)   The method of claim 59, further  
2               comprising deriving auxiliary power from any voltage within the

3 range of input voltages and providing the derived power as a  
4 power signal to a controller.

1 61. (New) The method system of claim 60, wherein  
2 providing in response thereto includes pulsing a transformer.

1 62. (New) The method of claim 58, wherein the  
2 range of input voltages spans at least a factor of two.

1 63. (New) A welding, cutting or heating  
2 system capable of receiving a range of input voltages  
3 spanning at least two input utility voltages, comprising:  
4 input means for receiving any input voltage within  
5 the range of input voltages, and for providing a first dc  
6 signal;

7 converter means for receiving and boosting the  
8 first dc signal and providing a converter output in response  
9 to at least one control input without reconfiguring a power  
10 circuit;

11 output means for receiving the converter output  
12 and providing a welding, heating or cutting signal; and

13 control means for controlling, including power  
14 factor correcting, the converter means, connected to the  
15 converter means.

1 64. (New) The system of claim 63, further  
2 comprising auxiliary power means for providing a control power  
3 signal to the controller in response to receiving any voltage  
4 within the range of input voltages.

1 65. (New) The system of claim 63, wherein the  
2 output means further comprises means for pulsing a transformer.

1                   66. (New)     The system of claim 63, wherein the  
2     range of input voltages spans at least a factor of two.

1                   67. (New)     A welding, cutting or heating  
2     system capable, comprising:

3                   a power circuit comprising an input circuit, a  
4     converter and an output circuit, wherein the power circuit  
5     is capable of providing a welding cutting or heating output;  
6                   wherein the input circuit is configured to receive  
7     at least one input voltage, and provide a converter input  
8     signal to the converter;

9                   wherein the converter includes a boost circuit and  
10    is configured to receive and boost the converter input  
11    signal and to provide a dc bus output, and configured to  
12    receive at least one control input;

13                  wherein the output circuit is configured to  
14    receive the dc bus, and to provide the welding, heating or  
15    cutting signal;

16                  a controller, including a power factor correction  
17    circuit, configured to provide at least one control signal  
18    to the converter; and

19                  an auxiliary power circuit configured to receive  
20    any voltage within a range of input voltages spanning at  
21    least two utility voltages, and configured to provide a  
22    control power signal to the controller.

1                   68. (New)     The system of claim 67, wherein the  
2     output circuit further comprises a pulsed transformer.

1                   69. (New)     A method of providing welding,  
2     cutting or heating current comprising:

3                   receiving the input voltage and converting it to a  
4     first dc bus having a voltage magnitude higher than the  
5     input voltage;

6                   controlling the converting, including power factor  
7                   correcting by controlling a switch;

8                   receiving the dc bus and providing in response  
9                   thereto an output current having an output magnitude  
10                   suitable for a welding, heating or cutting; and

11                   deriving auxiliary power from any voltage within a  
12                   range of input voltages spanning at least two utility  
13                   voltages, and providing the derived power as a power signal  
14                   to a controller.

1                   70. (New)       The method of claim 69, wherein  
2                   converting includes rectifying.

1                   71. (New)       The method of claim 70, wherein the  
2                   range of input voltages spans at least a factor of two.

1                   72. (New)       A welding, cutting or heating  
2                   system, comprising:

3                   input means for receiving any input voltage within  
4                   the range of input voltages, and for providing a first dc  
5                   signal;

6                   converter means for receiving and boosting the  
7                   first dc signal and providing a converter output in response  
8                   to at least one control input;

9                   output means for receiving the converter output  
10                   and providing a welding, heating or cutting signal;

11                   control means for controlling, including power  
12                   factor correcting, the converter means, connected to the  
13                   converter means; and

14                   auxiliary power means for providing a control  
15                   power signal to the controller in response to receiving any  
16                   voltage within a range of input voltages spanning at least  
17                   two utility voltages.

1                   73. (New) The system of claim 72, wherein the  
2 range of input voltages spans at least a factor of two.

1                   74. (New) A welding, cutting or heating power  
2 source capable of receiving a range of input voltages,  
3 comprising:

4                   an input rectifier configured to receive an ac  
5 input, wherein the range includes a highest magnitude and a  
6 lowest magnitude, and wherein the highest magnitude is at  
7 least twice the lowest magnitude, and wherein the rectifier  
8 is configured to provide a first dc signal;

9                   a boost converter connected to receive the first  
10 dc signal and provide a second dc output across positive bus  
11 and a negative bus, wherein the boost converter is  
12 configured to receive at least one control input, and  
13 wherein the boost converter includes a boost inductor having  
14 a first end in electrical communication with the rectifier,  
15 and the boost inductor has a second end in electrical  
16 communication with a switch, wherein when the switch is  
17 closed the second end is in electrical communication with  
18 negative bus, and wherein the second end is in electrical  
19 communication with a diode, and the diode is further in  
20 electrical communication with the positive bus, such that  
21 current can flow from the second end through the diode to  
22 the positive bus;

23                   a pulse width modulator connected to receive the  
24 dc bus and provide a pulsed signal;

25                   an output transformer, having a primary connected  
26 to receive the pulsed signal and to provide an output signal  
27 having a current suitable for welding or cutting on a  
28 secondary;

29                   a controller, including a power factor correction  
30                   circuit, configured to provide at least one control signal  
31                   to the converter; and

32                   an auxiliary power source capable of providing a  
33                   control power signal at a preselected control signal  
34                   voltage, for a plurality of input voltages.

1                   75. (New)    A method of providing welding,  
2                   cutting or heating power from a range of input voltages,  
3                   comprising:

4                   rectifying an ac input, wherein the range includes  
5                   a highest magnitude and a lowest magnitude, and wherein the  
6                   highest magnitude is at least twice the lowest magnitude,  
7                   and wherein the rectifier is configured to provide a first  
8                   dc signal;

9                   boost converting the first dc signal to a second  
10                  dc output across a negative and positive bus, including  
11                  receiving at least one control input, and boosting through a  
12                  boost inductor having a first end in electrical  
13                  communication with a rectifier, and a second end in  
14                  electrical communication with a switch, wherein when the  
15                  switch is closed the second end is in electrical  
16                  communication with negative bus, and wherein the second end  
17                  is in electrical communication with a diode, and the diode  
18                  is further in electrical communication with the positive  
19                  bus, such that current can flow from the second end through  
20                  the diode to the positive bus;

21                  pulse width modulating the dc bus to provide a  
22                  pulsed signal;

23                  transforming the pulsed signal to provide an  
24                  output signal having a current suitable for welding or  
25                  cutting;

26                  controlling the boost converting to power factor  
27                  correct; and

28 providing auxiliary power at a control power  
29 signal at a preselected control signal voltage, for a  
30 plurality of input voltages.